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ABSTRACT

To determine whether attendance at and time spent in industrial arts publishing activity centers effect gains in reading achievement, a study covering three years and involving more than 1,500 students in six elementary schools in New York City was undertaken. Data collected for each student included reading achievement test scores, number of minutes spent and times in attendance at the centers each year, ethnic group, sex, grade level, and mobility. Analysis of the data showed that publishing activity center programs had no statistically significant effect on reading achievement during their first year of operation, but that exposure to the centers had a positive effect on reading achievement scores across grade levels and schools during the second year of program operation and thereafter. Individual student test score gains were directly proportional to the hours spent in the centers. (Six appendixes contain descriptions of data collected, tables showing means and standard deviations of reading achievement scores, tables of the number of times and minutes of attendance at the centers, a description and the results of the multiple linear regression analysis procedure used, copies of the data collection instruments, and the interview schedule used by the paraprofessionals who directed the programs.) (FL)

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The Effects of Industrial Arts Publishing Activity Centers on Reading Achievement Scores

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INTRODUCTION

The purpose of this report is to describe the Industrial Arts Publishing Activity Center program and its effect on the Reading Achievement subtest scores of New York City elementary school students. Six New York City elementary schools participated in a research study as a cooperative effort between the New York City Bureau of Industrial Arts, and the New York State Education Department, Bureau of Industrial Arts Education and Bureau of Occupational Education Research.

The design of the study, data collection procedures, data analysis procedures, and final reporting were done by William Alwell of the Bureau of Occupational Education Research. Data collection was managed by Jarvis Baillargeon of the New York State Education Department, Bureau of Industrial Arts, and Herbert Siegel, Director of the New York City Bureau of Industrial Arts.

Researchers and reading specialists will be able to obtain further data analysis detail from the Bureau of Occupational Education Research. Information on program, facilities, and staffing will be available from the New York State Education Department's Bureau of Industrial Arts Education.

The information contained in these reports and bulletins will be of value to educational administrators and program planners who are concerned with the improvement of reading through a total program of school instructional activities.

BACKGROUND

An Industrial Arts Publishing Activity Center program has been operational in selected New York City elementary schools for several years under the leadership of the New York City Bureau of Industrial Arts. The program was originally supported by N D E A III funds and later by local funds. The program is currently operating in 1978-79.

The original funding objectives were:

To motivate learning in the academic disciplines.

To enhance, enrich, and make meaningful the abstract and theoretical.

To establish in-plant publishing activity center modules in the selected elementary schools for maximum participation by children involved in the project.

To provide children with an opportunity to apply academic learnings to the publishing activity center modules involvements (i.e. applications of classroom learnings).

To provide the schools and local communities with improved communications facilities for producing and distributing classroom and schools publications produced by children and to motivate children to use the graphic arts as a means of creative expression.

To teach safety practices in the operation of publishing equipment, especially when working with others.

To provide a basis for interdisciplinary involvement with science, language arts, social studies, mathematics, etc..

One of the anticipated outcomes of the program is to improve the elementary school students' reading ability. In order to test the effectiveness of the Industrial Arts Publishing Activity Center Program on students' reading ability, the New York State Bureau of Industrial Arts Education and the Bureau of Occupational Education Research, with the

cooperation of the New York City Bureau of Industrial Arts, initiated a study of the effects of the Publishing Activity Center program on elementary students' reading ability. The question asked in the study was:

> "Does exposure to Industrial Arts Publishing Activity Center activities, measured by the number of minutes and the number of times a student is in the Industrial Arts Publishing Center, effect the gain in Reading Achievement subtest scores of a sample of New York City elementary school children?

Six elementary schools in two New York City Community school districts were selected to participate in the study. Two criteria were used in selecting the schools: 1) a willingness to participate; and 2) that the Industrial Arts Publishing Activity Center was being implemented in each of the school buildings for the first time during the school year 1974-75.

Publishing Activity Centers are located in small size classrooms. The equipment used in the Centers include:

1. Electric Typewriter, w/starter package
2. Electronic Stencil Cutter, w/starter package
3. Stencil Duplicator, cabinet base
4. Plastic Ring Binding Machine, w/starter package
5. Sign Press Machine, w/starter package
6. 18" Paper Cutter, manual, with stand
7. 8-Bin Collator, electric, desk top model
8. Stapler, electric
9. Folding Machine, electric
10. Paper Jogger, electric

Additionally, general items such as desks, chairs, tables, storage cabinets, and assorted work surfaces are provided.

cabinets, and assorted work surfaces are provided.

Groups of students, sometimes committees, come to the Publishing Activity Center with copy prepared as a part of classwork, e.g. international recipes, poems, compositions. Editing of material has been completed with the classroom teacher. Art work and illustrations are complete. Page layouts are done and approved with the classroom teacher. Students then engage in writing, typing, typesetting, collating, binding, and stapling activities in the Industrial Arts Publishing Centers.

The activities in each school building are supervised by a paraprofessional responsible to both the building principal and the New York City Bureau of Industrial Arts. The resultant products of the student activities include flyers, newspapers, magazines, and booklets written and published by the students.

STUDENT PARTICIPANT CHARACTERISTICS

Students in the six participant schools generally represented middle class economic levels as determined by 1970 census data for the attendance areas of the schools. None of the participant school buildings were designated as ESEA I "target schools." The average income of families in the two districts is within the top 20 percent of all families in New York City based on the census data.[1/] The 1,558 participant students in the six elementary schools were of mixed ethnic background; 18 percent were Black; 11 percent were Oriental; 8 percent were Spanish surnamed; and 63 percent were Caucasian. Fifty-one percent of the participating students were male. Forty-four percent of the students were in grades five and six at the time they participated in the program; the remaining

1/ Fourth Count 1970 Census Report

56 percent of the participating students in all six schools were in grades two through four. Sixty-seven percent of the participating students remained in the same school building in which they had originally enrolled as kindergarten students; the majority of the remaining 33 percent of the participant students attended school in the same building for at least one and one half years. A majority of the students who participated in the program tested at, or above, grade level in reading achievement.

DATA COLLECTION

The number of times the students went to the Industrial Arts Publishing Activity Centers, and the amount of time the students spent in the Industrial Arts Publishing Activity Centers varied slightly between classrooms within each school building, and among school buildings. During the first year (1974-75) of program operation students in grades three through six participated in the program, while during the second year of operation (1975-76) students in grades two through six participated. Students in grades three through six participated in the program during the third year of data collection (1977-78).

The six elementary school buildings selected for the study had not had an Industrial Arts Publishing Activity Center previously. Initial participating students had had no prior exposure to activities specifically associate with the Center. The initial lack of exposure enabled the students to serve as their own control for data analysis purposes.

Data were collected during both the 1974-75, 1975-76, and 1977-78 school years. The study was originally scheduled for only the school years 1974-75 and 1975-76. Data collection, therefore, was not done during the 1976-77 school years. The significance of reading gains

during the second year of the study prompted a decision to extend the study further. The decision was made in order to assure that the second year results were not spurious. A third set of data was collected, therefore, during the fourth year of program operation (1977-78). The data collected included subtest and total scores of the 1974 Metropolitan Reading Achievement and 1975, 1976, and 1978 New York City Reading Achievement tests, number of minutes and times attended in the Industrial Arts Publishing Activity Center each year, ethnic group, sex, grade level, and the mobility of each student. The four student groups upon whom the data were collected were: 1) 481 students in grades three through six who participated in the Publishing Activity Centers for the first time during the first year of the Centers' operation; 2) 592 students who participated in the program for the first time during the second year of the Centers' operation; 3) 49 students who participated in the program for the second time during the second year of program operation; and 4) 436 students who participated in the program during the fourth year of the program. The data collected for each student are listed in Appendix I. Average Reading Achievement subtest grade equivalent scores and standard deviations are displayed in Appendix II. Publishing Activity Center attendance data were collected by the paraprofessionals who supervised the Publishing Activity Centers. Students typically kept a time log of Center attendance. Students recorded times for: 1) entering, 2) leaving, and 3) spent during each visitation. These entries were validated by paraprofessionals. The entries were then checked again and totaled by the paraprofessionals at the end of each year. The number of times and minutes attended are shown in Appendix III. Other study data, listed in Appendix I, also collected by the paraprofessionals,

were obtained from student records. A copy of the 1976 data collection instrument may be found in Appendix V.

RESULTS OF DATA ANALYSIS

The data were analyzed to determine the significance of the Publishing Activity Center participation on the rate of gain of participating students' reading achievement scores. Prior to the implementation of and participation in the program, Reading Achievement subtest and total test grade equivalent subtest scores were collected; most students' rates of gain showed some variance during each year they attended school. Using students' prior reading achievement scores, an amount of gain in reading achievement was predicted for each student for each of the three years in which data were collected. If the gain in reading achievement was greater than predicted, and the increase was determined to be statistically significant, i.e. due to other than chance factors, the Publishing Activity Center could then be considered to have an influence on reading achievement if this increase in rate gain could be associated with the time spent in attendance at the Centers. A multiple linear regression analysis procedure was used to determine whether or not any relationship existed between reading achievement and student attendance and participation at the Centers. 2/ Additionally, the analyses would indicate if a positive or negative relationship was statistically significant, or due to chance factors. The analysis procedure is described in Appendix IV.

The results of the analysis showed: 1) all Publishing Activity Center programs had no statistically significant effect on student reading achievement during their first year of operation in all of the six

2/ The procedure also accounts for differences between the 1974 Metropolitan Achievement Tests and the 1976-77-78 New York City Tests.

centers; 2) each Publishing Activity Center studied had a strong statistically significant association with an increased rate of reading achievement gain during its second and fourth year of operation for all students. Data were not collected during the third year of program operation for reasons previously given. Specifically, the analysis results showed the probability of the program having a positive effect was:

- Less than .05 during the first year of program operation. It was concluded that the aggregate time, and the number of times spent in attendance at the Publishing Activity Centers had no effect on a student's reading achievement subtest scores.

- Greater than .01 for both first and second year participant students during the second year of program operation. It was concluded that the aggregate time spent in, and the number of times attended at the Publishing Activity Centers had a direct effect on students' reading achievement subtest scores.

- Greater than .01 during the fourth year of program operation. It was concluded that the aggregate time in and the number of times spent at the Publishing Activity Center had a direct effect on a student's reading achievement subtest scores.

A more detailed analysis result is given in Appendix IV.

When the second year analayis was completed, it was then hypothesized that the increase in rate of gain might have been more heavily influenced by internal changes in the six schools' reading programs not related to the centers, but which coincided with the centers' first and second year of operation. An internal examination of the test data rejected this hypothesis. If reading program changes were a major influence:

- It is unlikely that student gains in reading achievement would be in proportion to their attendance at the Publishing Activity Center.

- Gains would probably be significantly different among the same grades in the six different buildings, which were located in two districts in different boroughs. They were not significantly different.

- A variance in significance in gain could be expected among the different grade levels within the same building. Such internal differences were not particularly significant.

Each of the participant school building principals were asked what, if any, reading program changes had occurred between 1974 and 1978. Their responses are displayed in Table 1.

Table 1

READING PROGRAM CHANGES BETWEEN 1974 AND 1975
REPORTED BY EACH OF SIX PARTICIPANT SCHOOLS

GRADE LEVEL	School Building					
	Kings County			Queens County		
	Community School District 22			Community School District 29		
	193	217	312	131	176	181
2	No Change	No Change	Open Court 1975	No Change	E.T.O. R.I.F. 1974	No Change
3	No Change	No Change	Open Court 1976	No Change	No Change	Ind. Reading 1 classroom 1975
4	No Change	No Change	Open Court 1977	No Change	No Change	Ind. Reading 1 classroom 1975
5	No Change	No Change	No Change	No Change	No Change	No Change
6	No Change	No Change	No Change	No Change	No Change	No Change

The data displayed in Table 1 show only five changes between 1974 and 1975. The individualized reading program started in one classroom in grade three, and one classroom in grade four. Since the increase in rates of gain were true in all schools, at grade levels three through six, and of students in other classrooms in P.S. 181, that one change could not have seriously effected the analysis results. The other four changes occurred prior to students entrance into the program, or following the year 1975. Both data and reports of participant building principals preclude the possibility that the increase in rate of change could have occurred because of reading program changes.

It was then hypothesized that lack of gain of first year students and the gain of students in the second and fourth year of the program might have been due to improvements in the coordination of the Publishing Activity Centers' program. The paraprofessionals who supervised the Publishing Activity Centers were then interviewed to determine what, if any, changes occurred. The interview schedule may be found in Appendix VII.

The significant differences between 1974-75 and 1975-76 reported by the paraprofessionals were:

- More experience with the specific school building, and with the children in the school building.
- More experience with the Publishing Activity Center's equipment.
- More faculty and administrative staff orientation.
- Greater parental involvement.
- Better coordination between the Publishing Activity Center paraprofessionals and the classroom teachers.

The result of the increase in professional and paraprofessional experience and exposure lead to:

- Integration of Publishing Activity Center activities and products with classroom teaching.
- Increased use and innovation of Publishing Activity Centers by classroom teachers.
- Greater faculty and administrative support of and participation in Publishing Activity Centers activities.
- More topics for materials to be printed, and developed cooperatively by paraprofessionals, teachers, and students.
- Publishing Activity Centers work requested by, rather than assigned to, students in the school buildings.
- Students tended to initiate, rather than be assigned project work.
- Increased student self reliance in both writing and use of equipment.
- Student readers discussed their interpretations of students' writing with the student writers themselves.
- Increased parental involvement with their children's Publishing Activity Center activities, and with the Publishing Activity Center paraprofessional.

CONCLUSIONS AND IMPLICATIONS

The purpose of the study was to determine whether or not attendance at and time spent in an Industrial Arts Publishing Activity Center effected a gain in reading achievement. The data analysis showed that exposure to Publishing Activity Centers had a positive effect on reading achievement scores across grade levels and buildings during the second year of program operation and thereafter.

Student individual test score gains were directly proportional to the contact hours spent in the Publishing Activity Centers (see Appendix VI).

It was also determined that for this type of program to be successful, administration, faculty, and students had to be oriented and receptive

to both the paraprofessional running the center, and the center activities themselves. Equally, the paraprofessional had to be familiar with the students, staff, and equipment. Therefore, when Publishing Activity Centers are implemented in a school building, at least two years of program development should be allowed before expecting positive results.

The success of an Industrial Arts Publishing Activity Center lies in the employment of a capable, interested and well trained paraprofessional. The paraprofessional's primary responsibility should be teaching children the use and capabilities of the equipment in the center. Volunteer or classroom teacher utilizations of Publishing Activity Centers may or may not accomplish the desired outcomes. Specific training in the use of the Publishing Activity Center equipment is necessary. One apparent cost of a successful Publishing Activity Center is a district's commitment to staff the unit with a qualified paraprofessional. Additionally, cooperation between staff with different responsibilities, and at different levels within the educational hierarchy is necessary to ensure effective implementation, support, and positive program results.

Further study of the effects of Publishing Activity Centers should focus on five areas: (1) the effect of exposure on the reading achievement of disadvantaged students; (2) the effect of exposure on the reading achievement of students in rural, suburban, and small city school districts; (3) the effect of exposure on reading achievement of high school and adult students in compensatory reading programs (i.e. "hard core" illiterate population); (4) identification of key factors which may enable the Activity Centers to produce positive effects on student reading achievement in less than the two year period found in this study; and (5) the utilization of classroom teachers in the Publishing Activity Centers.

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APPENDIX I

Data collected for analysis purposes were:

1. Four independent variables

   a) Students' exposure time, in minutes, to the Industrial Arts Publishing Center.
   b) Number of times a student was in the Industrial Arts Publishing Center.
   c) The three 1974 Metropolitan Reading Achievement Test subscores for the 1974-75 school year.
   d) The 1974 Metropolitan Reading Achievement Test subscores for 1974-74 and the 1975 New York City Reading Achievement Test subscores for the 1975-76 school year.

2. The dependent, or criterion, variable - the New York City Reading Achievement Test subscores for 1974-75

   a) Work Knowledge
   b) Reading Comprehension
   c) Reading Total (combination of 1 and 2)

3. Two control variables

   a) Grade level

      1) Grade 2 (during the 1975-76 school year)
      2) Grade 3
      3) Grade 4
      4) Grade 5
      5) Grade 6

   b) Mobility of the student -- measured by the number of months the student has attended school in the school building.

4. Four categorical factors

   a) School building

      1) PS 131
      2) PS 176
      3) PS 181
      4) PS 193
      5) PS 217
      6) PS 312

b) Students' sex

1) Female
2) Male

c) Students' ethnic group

1) Black
2) Oriental
3) Spanish American Surname
4) Caucasian

d) Bilingual

APPENDIX II

HIGHLIGHTS OF TABLE 1

The 1974 Reading Achievement scores of first year participating students in the first year of the Industrial Arts Publishing Activity Centers' program operation shown in Table 1 indicate their grade equivalent scores in the year immediately prior to their participation in the program. The Total Reading Achievement Test scores show:

- 38.8 percent of the participating students in grades three and four tested below grade level in 1974. The same percentage of students tested below grade level in 1975.
- 45.5 percent of the participating students in grades five and six tested below grade level in 1974 while 33.6 percent of these same students tested below grade level in 1975.
- 56.9 percent of all participating students tested at or above grade level in 1974 while 69.8 percent of the students tested at or above grade level in 1975. The difference between 1974 and 1975 can be attributed to the change in mean scores in grades five and six.

The Multiple Linear Regression Analysis showed no statistically significant relationship between Industrial Arts Publishing Activity Center attendance in 1975 during the first year of program operations. The analysis procedure also accounted for differences in the tests. The shift in percentages of students who tested above grade level between 1974 and 1975 in grades five and six is interpreted to be the result of the change in the test used.

Table 1

MEANS AND STANDARD DEVIATIONS OF 1974 METROPOLITAN AND 1975 NEW YORK CITY READING ACHIEVEMENT WORD KNOWLEDGE, READING COMPREHENSION, AND READING TOTAL SUBTEST SCORES BY GRADE LEVEL, FOR FIRST YEAR STUDENTS PARTICIPATING IN FIRST YEAR PROGRAM OPERATION

SPRING 1975		WORD KNOWLEDGE				READING COMPREHENSION				READING TOTAL			
		1974 MAT		1975 NYC		1974 MAT		1975 NYC		1974 MAT		1975 NYC	
GRADE LEVEL	NO.	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
3	67	3.6	1.2	5.0	1.2	3.3	0.8	4.4	0.8	3.5	0.9	4.5	1.0
4	114	4.8	1.4	6.0	1.8	4.9	1.6	5.8	0.3	4.7	1.3	6.0	1.5
5	188	6.7	2.0	8.3	1.3	7.0	1.9	8.2	1.1	6.9	2.0	8.5	1.0
6	112	6.3	2.0	8.9	1.8	6.1	2.5	7.9	2.3	6.2	2.5	7.8	2.3

HIGHLIGHTS OF TABLE 2

The 1974 Reading Achievement scores of first year participating students in the second year of Industrial Arts Publishing Activity Centers' program operation shown in Table 2 indicate their grade equivalent scores two years prior to their participation in the program. The 1975 scores indicate their grade equivalent scores one year prior to their participation in the program. Comparison of 1975 and 1976 Total Reading Achievement Test scores shows:

- 27.2 percent of participant students in grades three and four were reading below grade level in 1975 while 4.4 percent of these same students were reading below grade level in 1976.
- 33.8 percent of participating students in grades five and six were reading below grade level in 1975 while 17.6 percent of these same students were reading below grade level in 1976.
- 54.5 percent of all participating students tested at or above grade level in 1975 while 69.7 percent of these same students tested at or above grade level in 1976. While the change between 1975 and 1976 was greater in percentage in grades three and four than in grades five and six, the change itself was consistant across grades.

The Multiple Regression Analysis showed a statistically significant relationship between attendance at the Industrial Arts Publishing Activity Center in 1976 and Reading Achievement changes of first year students during the second year of program operation. Furthermore these differences are based on equivalent tests i.e., 1975 and 1976 New York City achievement tests. The results tend to substantiate a relationship between students' attendance at the Centers and the change rates reflected by achievement test score differences.

Table 2

MEANS AND STANDARD DEVIATIONS OF 1974 METROPOLITAN, 1975 AND 1976 NEW YORK CITY READING ACHIEVEMENT WORD KNOWLEDGE, READING COMPREHENSION, AND READING TOTAL SUBTEST SCORES BY GRADE FOR FIRST YEAR STUDENTS PARTICIPATING IN SECOND YEAR PROGRAM OPERATION

SPRING 1976		WORD KNOWLEDGE						READING COMPREHENSION						READING TOTAL					
		1974 MAT		1975 NYC		1976 NYC		1974 MAT		1975 NYC		1976 NYC		1974 MAT		1975 NYC		1976 NYC	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
GRADE LEVEL	NO.																		
2	87	--	--	--	--	4.8	1.3	--	--	--	--	4.7	1.2	--	--	--	--	4.8	1.1
3	165	--	--	4.5	1.4	5.0	1.7	--	--	4.0	1.1	4.6	1.4	--	--	4.3	1.2	4.9	0.6
4	134	3.4	1.1	4.5	1.6	6.0	2.0	3.1	0.9	4.1	1.0	5.3	1.0	3.2	1.0	4.3	1.3	5.7	0.6
5	152	5.1	1.7	5.9	1.9	7.2	2.3	5.0	1.6	5.9	1.2	7.5	2.2	5.0	1.6	6.1	1.6	7.7	2.1
6	54	4.3	1.0	6.3	1.5	9.1	1.5	4.5	1.1	6.5	1.3	9.3	1.4	4.4	0.9	6.7	1.4	9.6	1.2

HIGHLIGHTS OF TABLE 3

The 1974 Reading Achievement scores of second year participating students in the second year of the Industrial Arts Publishing Activity Centers' program operation shown in Table 3 indicate their equivalent scores one year prior to their first year of program participation. The 1975 scores indicate their grade equivalent scores at the end of their first year of participation in the program. The data show:

- When compared to students who went to the Activities Centers only in 1975 whose scores are displayed in Table 1, the fourth grade students had a lower average Total Reading Achievement score and the difference was statistically significant: sixth grade students were equivalent. (Table 3)

- The increase in participant student Total Reading Achievement scores between 1975 and 1976 in both grades four and six are statistically significant.

The difference between 1975 and 1976 Total Reading Achievement scores is consistant with the results of the Multiple Regression Analysis results which showed a statistically significant relationship between Center attendance in 1976 and Reading Achievement change of second year students during the second year of program operation. The results tend to substantiate a relationship between students' attendance at the Centers and the change rates reflected by achievement test score differences.

Table 3

MEANS AND STANDARD DEVIATIONS OF 1974 METROPOLITAN, 1975 AND 1976 NEW YORK CITY READING ACHIEVEMENT WORD KNOWLEDGE, READING COMPREHENSION, AND READING TOTAL SUBTEST SCORES BY GRADE FOR SECOND YEAR STUDENTS PARTICIPATING IN SECOND YEAR PROGRAM OPERATION

SPRING 1976		WORD KNOWLEDGE						READING COMPREHENSION						READING TOTAL					
		1974 MAT		1975 NYC		1976 NYC		1974 MAT		1975 NYC		1976 NYC		1974 MAT		1975 NYC		1976 NYC	
GRADE LEVEL	NO.	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
4	21	3.2	0.7	4.6	1.4	6.5	1.7	3.0	0.4	4.6	1.4	5.6	0.9	3.1	0.6	4.3	0.7	6.2	1.4
6	28	6.6	1.9	8.0	1.3	9.1	1.5	7.0	1.7	8.0	1.3	9.3	1.2	6.7	1.8	8.2	1.1	9.3	1.2

HIGHLIGHTS OF TABLE 4

The 1976, 1977, and 1978 Reading Achievement scores of students who participated in the fourth year of the Industrial Arts Publishing Activity Center program are shown in Table 4. The data show that more than 70 percent of the students were consistantly at or above grade level.

The Multiple Regression Analysis showed a statistically significant relationship between attendance at the Industrial Arts Publishing Activity Center and participant student Reading Achievement changes during the fourth year of program operation. The results substantiate a relationship between students' attendance at the Centers and the change votes reflected by achievement test score differences.

Table 4

MEANS AND STANDARD DEVIATIONS OF 1976, 1977 AND 1978 NEW YORK CITY READING ACHIEVEMENT WORD KNOWLEDGE, READING COMPREHENSION, AND READING TOTAL SUBTEST SCORES BY GRADE LEVEL FOR STUDENTS PARTICIPATING IN FOURTH YEAR OF PROGRAM OPERATION

SPRING 1978		WORD KNOWLEDGE						READING COMPREHENSION						READING TOTAL					
		1976 NYC		1977 NYC		1978 NYC		1976 NYC		1977 NYC		1978 NYC		1976 NYC		1977 NYC		1978 NYC	
GRADE LEVEL	NO.	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
3	157	--	--	3.6	0.9	4.0	1.2	--	--	3.7	0.9	4.5	1.4	--	--	3.5	0.8	4.1	1.2
4	129	4.1	1.6	5.3	1.9	6.0	1.7	4.1	1.6	5.9	2.3	5.9	2.0	4.1	1.5	5.9	2.0	5.9	1.8
5	88	3.5	1.1	5.3	1.3	6.0	1.7	3.6	1.0	5.6	1.7	6.3	1.7	3.5	0.7	5.5	1.4	6.7	1.5
6	62	5.7	1.7	6.5	1.7	7.2	1.7	5.1	0.9	7.0	2.0	8.2	1.9	5.4	1.4	8.2	1.9	7.9	1.7

APPENDIX III

HIGHLIGHTS OF TABLE 1

Table 1 shows the average aggregate number of minutes and times participant students attend the Industrial Arts Publishing Activity Centers. The average time spent during each visit varied both by grade level and year. Thus, during the first year of program operation all students spent an average of 46 minutes in the Centers during each visitation, 33 minutes during the fourth year of program operation. The average aggregate number of minutes, and of times visited also varied. Existing data, therefore, do not show either an optimal time for each visit, number of visits, nor aggregate times necessary for each visit in order to achieve positive effects on reading achievement scores.

Table 1

AVERAGE AGGREGATE NUMBER OF TIMES AND MINUTES STUDENTS ATTEND INDUSTRIAL ARTS PUBLISHING ACTIVITIES CENTERS DURING AN EIGHT MONTH PERIOD

GRADE LEVEL	1974-75			1975-76						1977-78		
	First Year Student First Year Program			First Year Student Second Year Program			Second Year Student Second Year Program			Fourth Year Program		
	N	Minutes	Times	N	Minutes	Times	N	Minutes	Times	N	Minutes	Times
2	--	--	--	87	153	3.7	--	--	--	--	--	--
3	67	287	5.2	165	180	5.8	--	--	--	157	306	5.0
4	114	583	8.7	134	181	5.2	21	116	3.7	129	300	5.1
5	118	578	8.7	152	313	6.9	--	--	--	88	262	7.4
6	112	384	10.8	54	114	7.2	28	468	9.6	62	435	8.9

APPENDIX IV

The data analyses were performed on a CDC 3300 computer at Cornell Univeristy and at the State Education Department at Albany, New York. The SPSS regression programs were used in the analysis. The default option was used; this option excludes any case in a specific equation of any variable value for that case, in the equation, has a missing value.

On the basis of the descriptive data, a multiple linear regression approach for hypothesis testing discussed by Cooley and Lohnes (1962) and Bottenberg (1963) was performed. The procedure generates a full model and a restricted model where the restricted model leaves out selected variable(s) included in the full model. The significance of the variable(s) left out is obtained by testing the difference between the R-squares of the full and restricted models with the F statistic. The general form of the analysis is:

$$F = \frac{(R^2 \text{ Full} - R^2 \text{ Restricted})/df=(f-r)}{(1-R^2 \text{ Full})/df=(n-f-1)}$$

The procedure tests a two-tailed hypothesis.

Table 1 lists the groups upon which the data analyses were performed and the results of the analysis. The results show no statistically significant effect during the first year of program operation; statistically significant effects were found during the second and fourth year of program operation.

Table 1

RESULTS OF MULTIPLE REGRESSION ANALYSIS

GROUP	QUESTION	ANSWER	SUBTEST	F	PROBABILITY ⩾ more than ⩽ less than
First Year Student First Year Program	Is there an effect of the number of times on Reading Achievement?	NO	1975 Word Knowledge	1.00	⩾.05
			Reading Comprehension	2.10	⩾.05
			Reading Total	1.21	⩾.05
	Is there an effect of number of minutes on Reading Achievement?	NO	1975 Word Knowledge	0.28	⩾.05
			Reading Comprehension	2.51	⩾.05
			Reading Total	1.20	⩾.05
First Year Student Second Year Program	Is there an effect of the number of times on Reading Achievement?	YES	1976 Word Knowledge	20.23	⩽.01
			Reading Comprehension	20.45	⩽.01
			Reading Total	16.93	⩽.01
	Is there an effect of number of minutes on Reading Achievement?	YES	1976 Word Knowledge	17.75	⩽.01
			Reading Comprehension	222.10	⩽.01
			Reading Total	18.24	⩽.01
Second Year Student Second Year Program	Is there an effect of the number of times on Reading Achievement?	YES	1976 Word Knowledge	16.05	⩽.01
			Reading Comprehension	16.00	⩽.01
			Reading Total	13.38	⩽.01
	Is there an effect of number of minutes on Reading Achievement?	YES	1976 Word Knowledge	26.76	⩽.01
			Reading Comprehension	16.18	⩽.01
			Reading Total	12.39	⩽.01
Third Year Program	Is there an effect of the number of times on Reading Achievement?	YES	1978 Word Knowledge	30.91	⩽.01
			Reading Comprehension	10.44	⩽.01
			Reading Total	17.12	⩽.01
	Is there an effect of number of minutes on Reading Achievement?	YES	1978 Word Knowledge	33.25	⩽.01
			Reading Comprehension	10.65	⩽.01
			Reading Total	21.52	⩽.01

As the F value increases the probability of a true difference, or effect, increases. Thus an F value of 1.00 indicates no effect. In this study, values greater than 6.76 indicate that there was an effect. The probability column indicates that the effect could be due to pure chance less than (⩽.01) 1 out of 100 or that effect was due to pure chance more than (⩾.05) 5 out of 100 times.

APPENDIX V

STUDENT WORKSHEET FORM

1. School _____

2. Grade level _____

3. Student's name _____

4. 1975 MAT grade equivalent scores for: Word Knowledge _____.____
Reading Comprehension _____.____
Reading Total _____.____

Aggregate hours exposure to Publishing Activity Center [ ]

Aggregate number of times in Publishing Activity Center [ ]

DIRECTIONS: When the student enters the Publishing Center, record the time in, time out, and total time.

	Time In	Time Out	Total		Time In	Time Out	Total		Time In	Time Out	Total		Time In	Time Out	Total
1.				31.				61.				91.			
2.				32.				62.				92.			
3.				33.				63.				93.			
4.				34.				64.				94.			
5.				35.				65.				95.			
6.				36.				66.				96.			
7.				37.				67.				97.			
8.				38.				68.				98.			
9.				39.				69.				99.			
10.				40.				70.				100.			
11.				41.				71.				101.			
12.				42.				72.				102.			
13.				43.				73.				103.			
14.				44.				74.				104.			
15.				45.				75.				105.			
16.				46.				76.				106.			
17.				47.				77.				107.			
18.				48.				78.				108.			
19.				49.				79.				109.			
20.				50.				80.				110.			
21.				51.				81.				111.			
22.				52.				82.				112.			
23.				53.				83.				113.			
24.				54.				84.				114.			
25.				55.				85.				115.			
26.				56.				86.				116.			
27.				57.				87.				117.			
28.				58.				88.				118.			
29.				59.				89.				119.			
30.				60.				90.				120.			

DATA COLLECTION FORM FOR READING
Industrial Arts

Program Name ...Career Awareness

Function No. _____

School:

Umbrella Administrator: _____
Director: _____
Coordinator: _____

Page _____ of _____

Name, Last, First	Present Grade	Number of Months In Program During Current Academic Year	1976 Comprehension	1976 Total	1977 Comprehension	1977 Total	1978 Comprehension	1978 Total
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								

IA PUBLISHING ACTIVITY CENTER FORM

1. School _____

2. Grade level _____

3. Student's name _____

4. Sex (check one) /_/ Male /_/ Female

5. Ethnic group (check one) /_/ Black /_/ Spanish American surname /_/ Oriental /_/ Other

6. Is the student bilingual? (check one) /_/ Yes /_/ No

7. Give the 1974 MAT grade equivalent scores for

Word Knowledge ____.____

Reading Comprehension ____.____

Reading Total ____.____

DO NOT USE

1. ___ ___ ___ School

2. ___ Grade level

3. ___ ___ ___ ___ Student ID

4. ___ Sex

5. ___ Ethnic

6. ___ Bilingual

1974 MAT

7. ____.____ WK ____.____ RC ____.____ RT

1975 MAT

8. ____.____ WK ____.____ RC ____.____ RT

9. _____ Aggregate hours exposure to Publishing Activity Center

10. _____ Aggregate number of times in Publishing Activity Center

APPENDIX VI

PARAPROFESSIONAL INTERVIEW SCHEDULE

I.A. PUBLISHING ACTIVITY CENTER - READING

PROGRAM IMPLEMENTATION CHARACTERISTICS

COMMENTS ON EACH TOPIC IDENTIFY BY SCHOOL

DIFFERENCES '74 - '75	193K	217K	312K	131Q	176Q	181Q	
APPROVAL DATE							
STARTING DATE							
FULL OPERATION DATE							
ALL SUPPLIES AVAIL. (Paper, Resource Books, References)							
EQUIP. AVAIL. AND OPERATING DATE							
CENTER AIDES HIRED AND ON-THE-JOB DATE							
AIDES FORMAL EDUCATION (H.S.) (2Yr.) (B.A.) (GRAD.) + EXPER.							

I.A. PUBLISHING ACTIVITY CENTER - READING

PROGRAM IMPLEMENTATION CHARACTERISTICS

COMMENTS ON EACH TOPIC

IDENTIFY BY SCHOOL

DIFFERENCES '74 - '75	193K	217K	312K	131Q	176Q	181Q	
AIDES FULLY ORIENTED RE. PROGRAM PURPOSES AND THEIR DUTIES							
CLASSROOM TEACHERS FAMILIAR WITH CENTER OBJECTIVES AND ACTIVITIES							
PRINCIPAL, ASST. PRIN., READING TEACHER COORD. ORIENTED AND FULLY SUPPORTIVE							
CLASSROOM TEACHERS COORDINATING LANGUAGE ARTS INSTRUCTION WITH CENTER ACTIVITIES							
SCHOOL LIBRARIAN ORIENTED AND ASSISTING AIDE							
STUDENTS REGULARLY SCHEDULED ON PRIORITY BASIS							
STUDENT ATTITUDE TOWARD CENTER PARTICIPATION							

I.A. PUBLISHING ACTIVITY CENTER - READING

PROGRAM IMPLEMENTATION CHARACTERISTICS

COMMENTS ON EACH TOPIC

IDENTIFY BY SCHOOL

DIFFERENCES '74 - '75	193K	217K	312K	131Q	176Q	181Q	
VOLUME OF PROJECTS INITIATED AND COMPLETED BY STUDENTS							
CHANGE IN TYPES OF PROJECT ACTIVITIES STUDENTS CARRIED OUT							
CHANGES IN DISSEMINATION ACTIVITIES OF STUDENT COMPLETED PROJECTS STATUS-MOTIVATION							
OTHER ITEMS:							